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THE IDENTITY OF *KNIPHOFIA PUMILA* (AIT.) KUNTH AND *K. CARINATA* C. H. WR.

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(With Plates XXII and XXIII)

1. **K. pumila** (Ait.) Kunth

Ever since an intensive study of the South African species of *Kniphofia* was resumed some years ago, a problem has been posed by the illustrations of *Tritoma pumila* in the Botanical Magazine t.764 (1804) and in Loddiges' Botanical Cabinet 5 : t.444 (1820). These are said to illustrate a species originally from the Cape, but no material in South Africa has been found to match them. Recently the probable type of *K. pumila* (Ait.) Kunth has been seen in the Herbarium of the British Museum (Natural History). It is a sufficiently good match of the above plates and confirms the view that *K. pumila* has been wrongly interpreted by monographers of the genus.

In May, 1958, I received some notes from Mr. J. N. Lythgoe of Trinity College, Cambridge, on the *Kniphofia* plants seen during his expedition to Abyssinia. He drew attention to the similarity between certain Abyssinian and South African species and, in particular, to the possibility of the Abyssinian species, *K. comosa* Hochst., being a synonym of the supposedly South African *K. pumila*. Further investigation supports this view and the results are now presented in some detail in order to clarify the position. I am grateful to Miss M. D. Gunn, Librarian of the Botanical Research Institute, Pretoria, for information relating to the early botanical collectors in Africa.

Kniphofia pumila (Ait.) Kunth, Enum. Pl. 4 : 552 (1843), excl. syn. *Veltheimia abyssinica* Red.; Bak. in Journ. Linn. Soc. 11 : 363 (1871); Journ. Bot. Lond. 23 : 277 (1885), partly, excluding South African specimens; Flora Cap. 6 : 279 (1896), partly, excluding South African specimens; Berger in Pflanzenreich IV, 38 : 45 (1908), partly, excluding South African specimen.

Aletris pumila Ait., Hort. Kew. 1 : 464 (1789); Mill., Dict. ed. 9 (1807).

Veltheimia pumila (Ait.) Willd., Sp. Pl. 2 : 182 (1799).

Tritoma pumila (Ait.) Ker Gawl. in Bot. Mag. t.764 (1804); Ait.f., Hort. Kew. ed. 2, 2 : 290 (1810); Lodd., Bot. Cab. 5 : t.444 (1820).

Tritomanthe pumila (Ait.) Link, Enum. 1 : 333 (1821); Schult. in Roem. & Schult., Syst. Veg. 7 : 631 (1829), partly, excl. syn. *Veltheimia abyssinica* Red. and Vel. d. Mus. d'Hist. Nat. 8.55.

Kniphofia comosa Hochst. in Flora 31 (1844); Bak. in Bot. Mag. t.6569 (1881); Fl. Trop. Afr. 7 : 452 (1898); Berger, l.c. 45 (1908).

K. infundibularis Bak. in Journ. Bot. Lond. 23 : 277 (1885); Flora Cap. 6 : 277 (1896); Berger, l.c. 44, t.17A (1908).

The protologue of *Aletris pumila* Ait., Hort. Kew. 1 : 464 (1789), reads as follows: "A. acaulis, scapo breviore foliis linearibus acute carinatis. Small Orange-flower'd Aletris. Nat. of the Cape of Good Hope. Mr. Fr. Masson. Introd. 1774. Fl. September–November." This description is insufficient for purposes of identifying a *Kniphofia*, but fortunately a specimen has been found in the B.M. Herbarium annotated: "Hort. Kew 1781, Aletris pumila" which may be regarded as the type specimen (Fig. 1). Although fragmentary, the specimen is nevertheless adequate, consisting of a portion of leaf, with smooth margins, 14·5 cm. long and 9 mm. wide, and four loose flowers. The flowers are funnel-shaped, 12·5 mm. long, narrow at the base, expanding abruptly to 6 mm. wide at the mouth. These are unlike the flowers of any species known to exist in South Africa. They are, however, matched by the following:

(*a*) The illustrations of *Tritoma pumila* (Ait.) Ker Gawl. in Bot. Mag. t.764 (1804) (see Fig. 2) and Lodd., Bot. Cab. 5 : t.444 (1820) referred to in the opening paragraph. Apparently no herbarium specimens of the figured plants were made, as none has been found, but the illustrations agree with the type specimen in the short, funnel-shaped flowers, which are orange to yellow in colour. In the description accompanying the Bot. Mag. plate, however, the leaf margin is described as being minutely scabrid.

(*b*) The type specimen of *K. infundibularis* Bak., which is from the Herbarium of Bishop Goodenough, acquired by the Royal Botanic Gardens, Kew, in 1880. According to Baker in Flora Capensis 6 : 278 (1896) it was "dried from Kew Gardens about 1780", though this information does not appear on the sheet. In this specimen, the perianth is distinctly funnel-shaped, about 11 mm. long, narrow at the base and expanding abruptly to 8 mm. wide at the mouth.

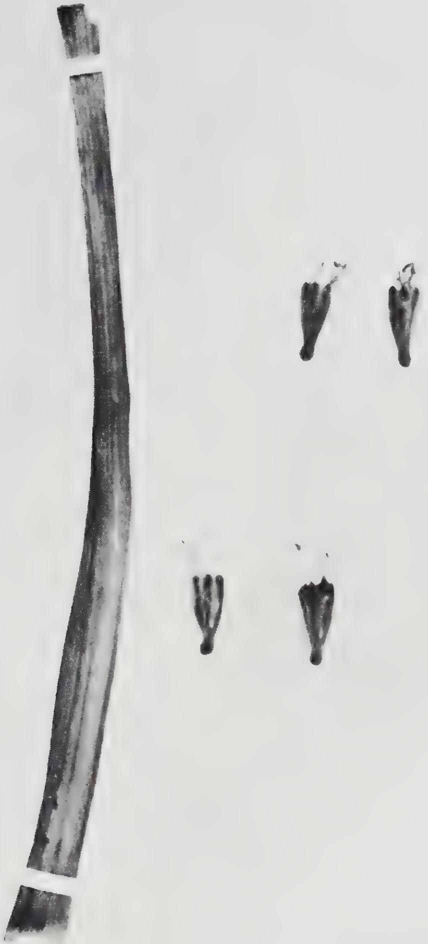

PLATE XXII. Type specimen of *Kniphofia pumila* (Ait.) Kunth in BM (natural size).

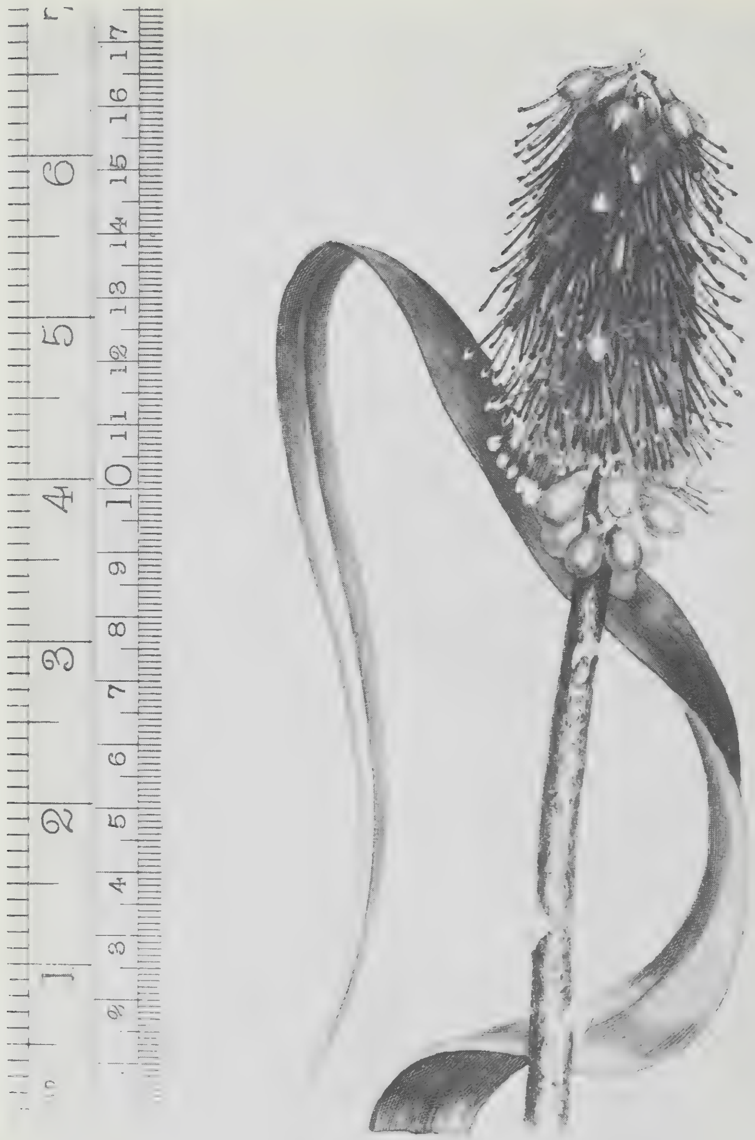

PLATE XXIII. *Tritoma pumila* (Ait.) Ker Gawl. in Bot. Mag. t.764 (1804).

Baker in Journ. Bot. Lond. 23 : 277 (1885) describes the flowers as being "all yellow".

(*c*) Specimens of *K. comosa* Hochst., an Abyssinian species. The type of *K. comosa*, which is *Schimper* 1192 from Abyssinia, was evidently seen in Berlin Herbarium by Berger, l.c., who published a sketch of two flowers in his monograph. This specimen can no longer be found and must be presumed to have been destroyed, though the majority of *Kniphofia* types in Berlin survived. There are, however, two sheets of this number in Kew Herbarium which agree in essentials with the type of *K. pumila* in B.M., as does the illustration of *K. comosa* in Bot. Mag. t.6569 (1881). The following specimens, now classified as *K. pumila*, were among those seen at Kew: Abyssinia, *Schimper* 1145 (2 sheets); 1192 (2 sheets); Ethiopia, Temcha gorge, *Lythgoe* 721; 722; ex Hort. Elwes, "type specimen of Bot. Mag. t.6569".

On this evidence, *K. comosa* is relegated as a synonym of *K. pumila*, and it now seems clear that the latter did not originally came from the Cape of Good Hope, as stated by Aiton, but from Abyssinia. The question arises whether any collector could have introduced the species from Abyssinia at such an early date. Such a role could have been filled by James Bruce, who spent the years from 1769 to 1772 in north Africa, and who returned to Marseilles in March 1773. According to "The Banks Letters" edited by Warren R. Dawson, p. 177 (1958), Bruce "sent last October (1773) through the Consul at Leghorn a collection of seed, chiefly collected in Abyssinia, directed to Mr. Eaton (Aiton) at the King's Garden at Kew and hopes that they have arrived." Bruce eventually reached England in 1774, the year recorded by Aiton for the introduction of *K. pumila*.

In 1774 Francis Masson was at the Cape and there is evidence that, about this time or a few years later, he was responsible for the introduction of at least one *Kniphofia* into England. Thus there is a basis for the confusion which arose regarding the origin of the cultivated plants of *K. pumila*. The real Masson plant is preserved as a specimen, also in the B.M. Herbarium, annotated "Aletris uvaria ? Hort. Kew 1786 (e Cap b. Spei per Masson 1780)." To one who has studied the genus closely, this specimen is clearly distinct from the specimen labelled "Hort. Kew 1781, Aletris pumila." It has longer flowers which are 18—20 mm. in length, narrow at the base and expanding to 5 mm. wide at the mouth, and the flowers are not distinctly funnel-shaped. From a knowledge of modern material, this specimen is obviously a representative of the South African species *K. ensifolia* Bak., of which *K. rivularis* Berger is a synonym and *K. tuckii* Bak. is no more than a variety.

It is apparent that Baker came to include this 1786 specimen in his concept of *K. pumila* and later applied the name solely to the South African plants.

Thus, in Journ. Linn. Soc. 11 : 363 (1871), he describes the perianth of *K. pumila* as being 6—8 lin (12·5—17 mm.) long and 2½—3 lin (5—6 mm.) wide at the mouth though, in this work, he does not cite any specimens. In Journ. Bot. Lond. 23 : 277 (1885) and in Flora Capensis 6 : 279 (1896), he describes the perianth as being ⅝ to ¾ inch (16—19 mm.) long and ⅙ inch (4 mm.) wide at the throat while, in addition, he cites *Burchell* 2554 from "Bechuanaland" and *Shaw* s.n. from Colesberg. Both these specimens have been examined and should be included in *K. ensifolia* Bak. *sens. lat.* Furthermore, when he described the closely related *K. tuckii* in the Gardener's Chronicle 13 : 68 (1893), he enlarges on his views in the following terms: "For many years he (Herr Max Leichtlin) has been trying to re-introduce *K. pumila.* At his instigation Mr. Tuck recently undertook an expedition to the province of Colesberg, where *K. pumila* was last gathered by the late Dr. John Shaw. He brought home the present plant, which, although nearly allied to *K. pumila* (of which we have at Kew fine specimens collected by Burchell) differs from it . . . etc." Having altered the concept of *K. pumila* to agree with these South African specimens, it is not surprising that Baker, in 1885, redescribed the true *K. pumila* under the appropriate name *K. infundibularis*, basing his species on Bishop Goodenough's specimen acquired by Kew in 1880, and which was gathered in Kew Gardens in 1780, about the same time as the type specimen of *K. pumila.* Berger, in his monograph in Pflanzenreich IV, 38 : 45 (1908), followed Baker's treatment of *K. pumila*, giving the perianth measurements as 11—18 mm. long and 4—6 mm. wide at the mouth. He, however, cites only the *Burchell* specimen and expresses doubt as to whether its identification as *K. pumila* is correct.

The 1786 specimen discussed above, annotated "Aletris uvaria ?" and now identified as *K. ensifolia* Bak. was, of course, available to Aiton and the question may be asked if Aiton did not also include this specimen of South African origin in his concept of *K. pumila*, or even possibly base *K. pumila* exclusively upon it. As already pointed out, his protologue of *K. pumila* is extremely vague, but his reference to orange flowers excludes *K. ensifolia* from further reckoning; also, *K. pumila* flowered in the English autumn (September–November) and, while not as conclusive (making allowance for the changed conditions to which cultivated plants are subjected), this may be cited as additional evidence against *K. ensifolia*, which is a spring-flowering species. The normal flower colour of *K. ensifolia* is well illustrated in the Botanical Magazine, t.7644 (1899) under the name *K. tuckii* Bak., in Flowering Plants of South Africa t.866 (1942) under the name *K. rivularis* Berger, and in Letty, Wild Flowers of the Transvaal t.19 (1962). The buds are red and the flowers become creamy-white to greenish-white as they open. It is significant that the plant figured as *K. tuckii* flowered at Kew in the month of April, thus retaining its spring-flowering character. There is, therefore, no evidence that Aiton had any material of the South African species *K. ensifolia* in mind when he described *Aletris pumila*.

To return to the plate of *Tritoma pumila* (Ait.) Ker Gawl. in Bot. Mag. t.764 (1804), a feature which initially added to the difficulty of interpretation may be seen in the globose structures at the base of the inflorescence. These were, at first, interpreted as round, apparently baccate, fruits, which would mean excluding the plant from the genus *Kniphofia*. Finally the probable explanation was supplied by a specimen of *K. isoëtifolia* Hochst., collected in Abyssinia by Dr. G. W. Reynolds during his *Aloe* studies and cultivated at his home in Johannesburg in 1954. In this specimen the raceme was remarkable in that the flowers opened from the apex downwards. By analogy, the round structures at the base of the inflorescence in the above Bot. Mag. plate would represent flower buds. Confirmation is provided by Mr. Lythgoe's observations in Abyssinia. He records that the observed inflorescences of both *K. isoëtifolia* and *K. pumila* were basipetal. The only published reference to this remarkable characteristic so far found is by N. E. Brown in 1914 and this is discussed under the next heading.

2. **K. carinata** C. H. Wr.

K. carinata C. H. Wr. provides a case almost parallel to *K. pumila*. C. H. Wright described the plant in 1914 as "a South African species for the introduction of which horticulture is indebted to Miss Ayliff of Rose Cottage, Grahamstown, by whom seeds were presented to Kew in 1892." It is not matched by any material indigenous in South Africa and can scarcely be separated from the Abyssinian species, *K. leichtlinii* Bak. ex Hook.f. As there is no valid reason for maintaining it, it is placed in synonymy under the latter species. In the absence of clear evidence it may be conjectured that either Miss Ayliff originally received the species from Abyssinia (which is unlikely), or that the garden records at Kew may have been at fault.

K. leichtlinii Bak. ex Hook.f. in Bot. Mag. t.6716 (1883); Bak. in Fl. Trop. Afr. 7 : 452 (1898); Berger in Pflanzenreich IV, 38 : 46, t.17B, C (1908).

K. carinata C. H. Wr. in Bot. Mag. t.8545 (1914).

This species is closely allied to *K. pumila*, differing mainly in the longer perianth, which is 18—22 mm. long. N. E. Brown, in Gard. Chron. Ser. 3, 56 : 410 (1914), makes the following interesting comment while discussing a plant cultivated at Kew under the name *K. comosa*: "The peculiarity of this plant (shared also by typical *K. leichtlinii*, the true *K. comosa* and *K. carinata*) is that when the stem bears only one spike, instead of the lowest flowers of the spike opening first, as in the other kinds in cultivation, it is the uppermost flowers on the spike which mature and expand first, whilst the lower are in bud. But when the stem branches and bears one or two lateral spikes, the flowers of the terminal or main spike open as just described from above downwards, whilst on the lateral spikes the reverse is the case, the lowest flowers opening first . . . as is normally the case in all the other kinds in cultivation." Such remarkable variation in what one would regard as a fundamental character deserves further investigation. If the plate of *K. carinata* in Bot. Mag. t.8545 (1914) is examined closely, it will be seen that it apparently has buds at the apex and at the base of the inflorescence. If this is actually the case, it would appear to be a transition between a basipetal and an acropetal inflorescence.